

SEA SCOUT BASE

~ Sandvlei ~

Seamanship Manual

G. Water Charge Certificate

Pages 86-94

SAFETY RULES AS PER P.O.R.**WATER ACTIVITIES IN A DISTRICT**

- 514.1 Whenever boating is part of the program for Scouts, a special sub committee of the LA Exco (rule 513.3) **MUST** be formed to be responsible for the compilation, issue and observance of local rules for the use, condition and equipment of all vessels and boats, and for the safety of those using them (see also rule 902).
- 514.2 Subject to the approval of any Regional Commissioner concerned, a joint committee may be formed where two or more LAs, even if in different regions, but on the same stretch of water, such joint committee will also co-ordinate and advise on all boat training on these waters.
- 514.3 The Water Activities committee (under both rules 514.1 and 514.2) must in particular provide and submit to the Assistant Area Commissioner for Water Activities through the DC and the LA for approval of local rules for:
- The inspection of all boats used by SCOUTS in their Area and for approving or otherwise their use, with or without special conditions;
 - Restricting the sail area of such boats and the number of persons which such boats may carry;
 - The provision of air tanks, life belt, and other safety devices;
 - Ensuring that such vessels or boats, when in use, shall be properly manned and in charge of a competent person (rule 902);
 - The proper care and maintenance of any vessels and boats allotted to them by the Area/Regional Scout Councils, and for observing the conditions attached to such allotment.

902 BOATING

The term BOATING includes all activities on vessels on water and includes rowing, sailing, motor boating and rafting. The term BOATS includes all vessels of a permanent construction and includes dinghies, yachts, motorboats, but excludes vessels of a non-permanent construction, e.g. rafts and coracles.

- 902.1 No Scouter or other person in charge for the time being shall allow any SCOUT to take part in BOATING without first considering carefully all the conditions, and in particular having satisfied himself:
- 902.1.1 That the Scout can swim 50 meters in shirt, shorts and stockings. This precaution may be relaxed in the case of lakes and streams where it is known that there is no danger and the depth of water nowhere exceeds one meter;
- 902.1.2 That all reasonable precautions have been taken to avoid BOATING in waters infested with bilharzia;

- 902.1.3 That everyone aboard the vessel wears a personal buoyancy aid (PBA) of a type approved by the Director-General, Dept. of Transport, with the exception of those pulling an oar as a member of a boat crew, in which case buoyancy aids must be carried in the boat.
- 902.1.4 That every SCOUT forming part of the crew of any boat under oars or under sail is sufficiently responsible.
- 902.2 No BOAT shall be taken into use, nor continue to be used, until a current "Boat Certificate" has been issued in terms of Rule 514.
- 902.3 No BOAT shall be used in the SCOUT program unless properly manned and under the charge of a person wither holding an appropriate Charge Certificate issued for the purpose, or otherwise authorized by the Water Activities Committee of the LA or Area (see Rule 514).
- 902.4 All BOATING activities shall comply strictly with all legislation and regulations of any competent authority jurisdiction over the activity or place of such activity.
- 902.5 The Area Water Activities Advisory Committee shall define other requirements at its discretion.

903 CHARGE CERTIFICATES

Water Charge Certificates are issued by the A Area C for Water Activities. Air Charge Certificate application forms are available from Area HQ.

- 903.1 **WATER CHARGE CERTIFICATES**
Examiners for Water Charge Certificates must be nominated by the Badge Examiners Committee of the LA and approved by the A Area C for Water Activities.
- 903.2 **WATER CHARGE CERTIFICATE EMBLEMS**
A badge will be awarded to a SCOUT or a Scouter who qualifies for a Water Charge Certificate. The badge, which will be the same for all types of Water Charge Certificates, shall be a Sea Scout badge (a fouled anchor with the South African arrowhead badge superimposed). The badge shall have a blue background. The badge is worn as described in Rule 808.3
- 903.3 **TYPES OF WATER CHARGE CERTIFICATE**
A Water Charge Certificate may be issued for any of the following types of boat:
- (a) open boats under oars
 - (b) open boats or decked boats under sail
 - (c) power boats

A Water Charge Certificate shall further be endorsed for:

- inland waters with no special difficulties and/or
- special inland waters and/or
- coastal waters in accordance with local conditions, as defined by the Area Water Activities Advisory Committee.

903.4 WATER CHARGE CERTIFICATE REQUIREMENTS FOR SCOUTS

903.4.1 The issue or endorsement of a Water Charge Certificate for open boats under oars shall be conditional on the holding of the Boatman Badge.

903.4.2 The issue or endorsement of a Water Charge Certificate for open or decked boats under sail shall be conditional on the holding of the Boatman and Helmsman Badges.

903.4.3 The issue or endorsement of a Water Charge Certificate for powerboats shall be conditional on the holding of the Boatman and Motor-boatman Badges and on the possession of and elementary practical knowledge of motors and the ability to effect simple repairs.

903.4.4 The endorsement of a Water Charge Certificate for special inland waters and for coastal waters shall be at the discretion of the Area Water Activities Advisory Committee, and conditional on holding the Lifesaver Badge.

903.4.5 In addition, the Area Water Activities Advisory Committee shall lay down such additional requirements as it may deem necessary in regard to:

1. knowledge of boats and boat work as applied to the type of boat and the class of water;
2. knowledge of boat orders; the ability to give them and to apply them;
3. knowledge of safety precautions; the ability to comply with them and to secure compliance with them;
4. knowledge of the appropriate action in emergencies; the ability to carry out such actions and to secure the obedience of others in emergencies;
5. knowledge of the "Rules of the Road" on water.

903.4.6 Candidates for Water Charge Certificates or endorsements must be recommended by their TSs and Group Councils as capable leaders.

903.4.7 Where necessary, the examiner for the Water Charge Certificate or endorsement may require candidates to re-pass parts of all of the test for qualifying badges.

903.5 WATER CHARGE CERTIFICATE REQUIREMENTS FOR SCOUTERS AND ROVERS

Scouters and Rovers applying for Water Charge Certificates or endorsement may be required to demonstrate a suitable standard of competence, based on the knowledge required of a Scout candidate.

THEORY OF SAILING:**1. CENTRE OF EFFORT (C.E.)**

This is the center point of the effort exerted by the wind on the sails. The position of this point is determined by the cut and/or shape of the sails, and can be moved by shifting the mast forward or aft, or by increasing/decreasing the rake of the mast.

2. CENTRE OF LATERAL RESISTANCE (C.L.R.)

This is the center point of resistance offered by the underwater portion of a boat's hull when dragged laterally or sideways through the water. In a dinghy, the CLR can be altered by raising or lowering the centerboard, or by shifting the crew weight forward or aft.

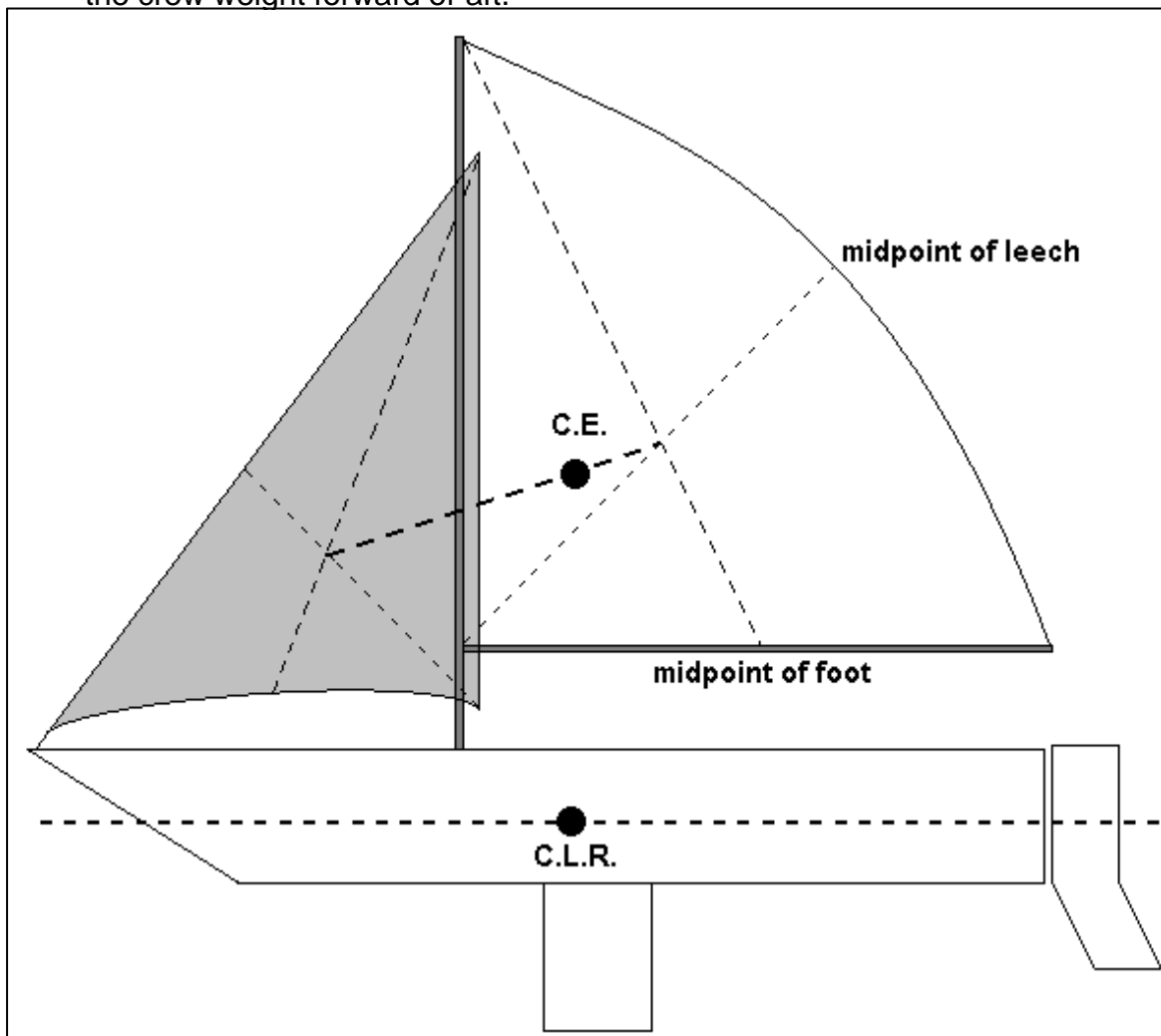


Figure 1 – Schematic diagram of the approximate positions of the C.E. and C.L.R.

3. FORCES ACTING ON THE BOAT

3.1 Beating to windward:

A correctly balanced yacht is designed with the **CE just aft of the CLR** when the centerboard is fully down and the sails are sheeted in hard (see fig.1). The sails are cut to set with an aerodynamic section similar to the wing of an aircraft. The wind passing over the outer curve of the sail accelerates at a greater rate than the wind across the inner curve, because it has to travel further. It also becomes more turbulent, and both these factors result in an area of lower pressure, or lift, to the leeward of the sail.

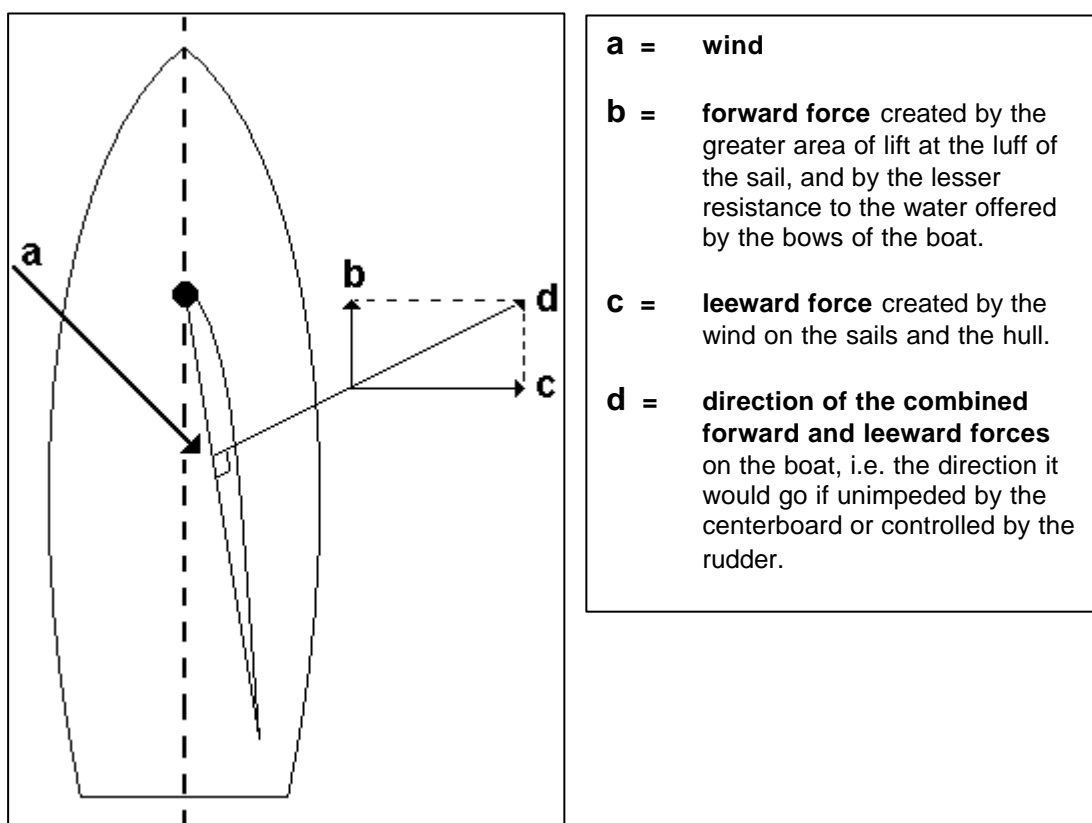


Figure 2 – shows the forces involved

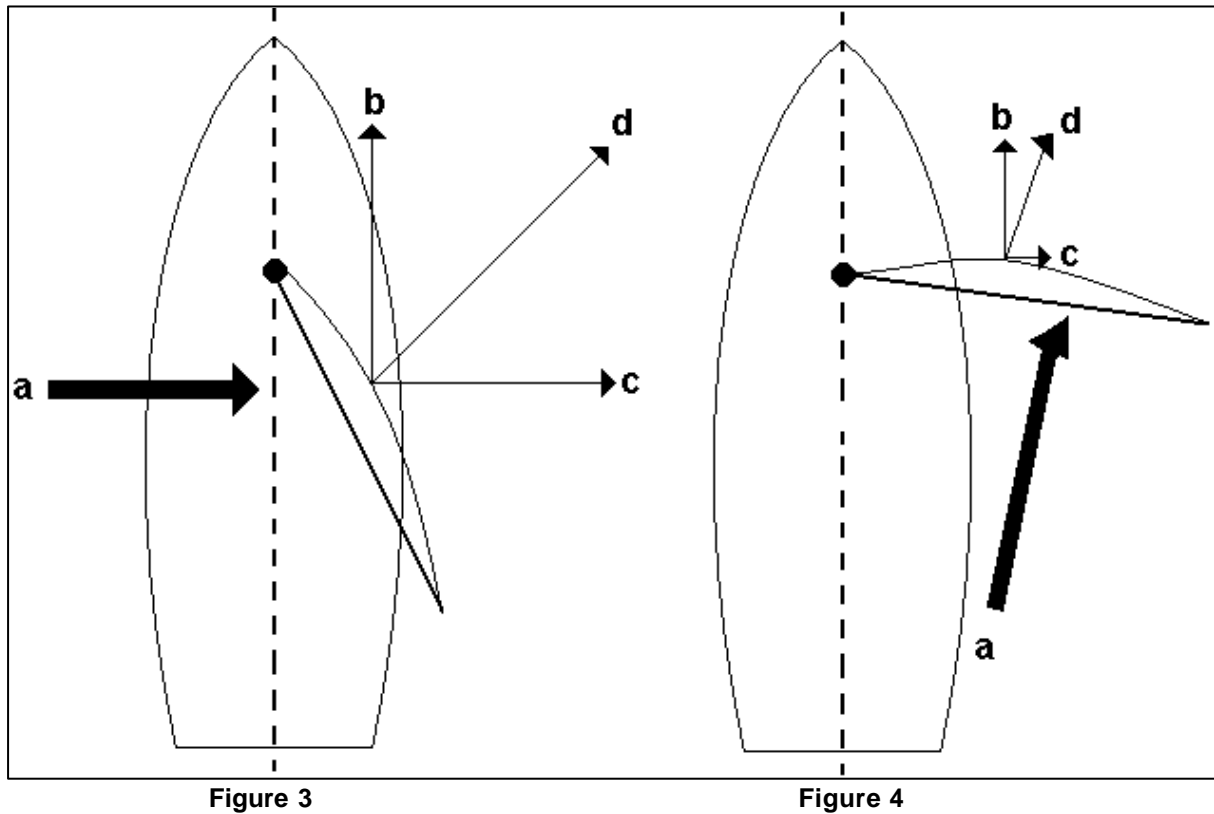
You will see that the forward force (**b**) is relatively small compared with the leeward force (**c**), when the boat is beating to windward. This is why beating is not as fast as reaching. As soon as the centerboard is lowered right down, the resistance of the hull to the leeward force (**c**) is greatly increased. The **CLR moves forward of the CE** and the force of the wind tends to heel the boat and pivot the hull to windward.

If, at this point, the weight of the crew sitting to windward prevents the boat from being heeled and spilling the wind, the main force of the wind is channeled into driving the boat to windward.

Note: a correctly balanced boat will carry a slight amount of **weather helm**, that is, with the helm amidships, she will tend to luff up into the wind. This is also a safety feature, as, if for any reason the tiller is accidentally released, the boat will automatically head to wind and spill the wind from the sails. A boat that carries lee helm can become uncontrollable in a sudden gust, as she may swing violently to leeward and broach or capsize.

3.2 Reaching:

Figure 3 shows that when a boat is sailing on a broad reach, the force of the wind on the sail exerts a greater forward thrust (**b**) than it did in figure 2 (beating). The leeward force (**c**) is proportionately reduced. To avoid excessive weather helm, it is necessary to partly raise the centerboard, shifting the **CLR aft of the CE**, and at the same time, reducing the frictional resistance offered by the centerboard. Reaching is the fastest point of sailing.



3.3 Running:

Figure 4 shows that on the run, the leeway force (**c**) has almost been eliminated and that (**d**) makes a fine angle with the forward force (**b**). Most of the wind is now concentrated in the sail to push the boat in a forward direction. Very little centerboard is required to provide sufficient lateral resistance to keep the boat from side-slipping.

NAVIGATION:

Introduction

Navigation is not a science, it requires an understanding and continuous practice. For Sea Scouts it is necessary to realise that we are **not** training “Master Mariners”, but rather boys who wish to sail a boat on a set course, and arrive in the same place as his mates.

School Influences

With the advent of practical teaching in schools, most boys have a basic knowledge of mapping, geography and the sea. It is surprising how many boys know about GPS, Satnav and Geostationary Orbit position fixing. Through all this, we need to recognise that all we want to teach the boys is basic navigation. Bear in mind that Navigation is a 3-year full time course.

Training Program

The course consists of:

1. The World and all its markings
2. Scales
3. The chart and all its symbols
4. The parallel ruler and dividers
5. Plotting a position
6. Plotting a course
7. Reporting a position
8. Chart plotting, neatness, recording data

Let us examine each of these in detail.

1. The World and all its markings

Draw a circle to depict the “World” and show the **North Pole, South Pole, Equator, parallels of latitude** and **meridians of longitude**. Sketch in **Africa** and then pull out the **Cape Peninsula** onto a flat chart.

Discuss briefly the **Mercators projection**, which is similar to placing a lamp inside the world and projecting onto a toilet roll.

Highlight that the latitude lines are parallel and the longitude lines converge. Thus for navigation, only the latitude lines are used to measure distance.

2. Scales

Most boys will have a desire to use the geographic scale, as placed on the chart. Teach them that: *“one minute of latitude = one nautical mile”*.

Show this on the chart and answer the question: one nautical mile is approximately **1.853km**.

It is also worth relating a feature to the nautical mile, like the Port of Cape Town breakwater, which is half a nautical mile.

1 nautical mile = 6080 feet, or 2026 yards, or 1853 metres. So for comparison of speed, 30 knots = 55km/h. A knot is a nautical mile per hour.

Next, discuss the compass rose and distinguish between the true compass rose and the magnetic compass rose.

Avoid the True and magnetic difference, calculations and insist that the magnetic rose be used for all chart work. This magnetic rose is the same as the plastic compass in the Scout kit, and the compass that is used on the saldanha sailing dinghy.

3. **The chart and its symbols**

To gain maximum benefit from the chart, point out the following:

- Name and number of the chart
- Continuation charts
- Metric or fathoms
- Year of print and updates (revisions)
- Value of contour lines
- Symbols for buoys, rocks, wrecks, lighthouses
- Lighthouse signatures and explain the data
- Point out the notes
- Review water depths
- Locate mountain peaks

4. **The parallel ruler and dividers**

Do not assume that all know how to use these instruments. Show the “press and lift” technique of the parallel ruler and the “squeeze” use of the dividers. Point out the concept of 5 miles on the dividers and squeeze the 2.2 miles. Allow them time to “walk” from the top of the chart to a parallel of latitude and check accuracy.

5. **Plotting a position**

Positions are plotted as a **fix** • or a **D.R.** X, where the **fix** is a “known position” and a **D.R.** is an “estimated position”.

All lines on the chart should be feint, travel through the point, and not extend beyond the required position. Positions and course on a chart should be labelled and include time, bearing and direction.

Neatness, line quality, accuracy and labels defines the quality of chart work. This is where most competition marks are lost.

6. **Plotting a course**

The chosen course should avoid dangerous zones, shallows, and follow reasonable routing. If laying off a course, look for simple degrees, full nautical miles and relate all to boat speed.

- The formula for **speed** is : **$S = D/T$**

This is the only formula and by manipulation, distance and time can be calculated.

7. Reporting a position

A position is always reported from the boat to the shore. This is done for two reasons:

- usually the compass readings are taken from the boat.
- at a land base, there is time to calculate the reciprocals.

When using land fixes, use beacons that give good intercepts, all visible from sea and identifiable physically.

8. Chart plotting

The plotting on a chart is an “insurance document”. No matter what electronic navigation aids are available, the Marine Court will request a plotted chart in an investigation.

Sea rescue authorities will call for the chart in trying to solve sea and rescue operations. Also the chart is “fool-proof”, as you only require the boat compass, parallel ruler, divider and the correct chart.

Encourage the boys to use yellow landmass for all their calculations. This allows for correcting the mistakes. On the compass rose show the course, with a short line on the magnetic compass rose. This assists in obtaining the correct bearing.

Focus on clean crisp lines, neatness, accuracy, and a deeper understanding of all the chart symbols in which the boy is navigating. Do not allow them to put the boat at risk by crossing wrecks, reefs, or too close to shore.

LECTURE AIDS:

- Not all Troops have access to S.A.N charts. For training, an A3 photocopy of the chart also works very well.
- Mark the latitude and longitude scales with the missing degree values.
- Use a yellow highlighter and colour the seashore.
- Ensure that a compass rose is copied onto the chart.
- A school compass with pencil will serve as dividers.
- Two set-squares can be used as a substitute for a parallel ruler.
- Stick the chart to a table with masking tape.
- Provide a box of **HB** pencils, soft erasers and a sharpener.